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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/895,466	06/29/2001	Robin Budd	EMC-00-066	6561

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EXAMINER	
PARK, ILWOO	

ART UNIT	PAPER NUMBER
2182	

MAIL DATE	DELIVERY MODE
03/04/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/895,466	BUDD ET AL.	
	Examiner	Art Unit	
	ILWOO PARK	2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,6 and 8-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,6 and 8-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/19/2008 has been entered.

2. Claims 1 and 11 are amended in response to the last office action. Ohran et al and Vinther et al were cited, previously.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 5, 6, and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohran et al. [US 5,812,748] in view of Yamagami [US 7,096,269 B2] and further in view of Vinther et al. [WO 92/18931].

As for claim 1, Ohran et al teach in a computer system having a plurality of computers [e.g., server computers 111, 121 in figs. 1, 2], each connected to a storage system [mass storage systems 113, 122 in figs. 1, 2], each of the storage systems in communication via an alternate path [e.g., connection means 241 in fig. 2;

communication means 2102 in fig. 6; link between communication means attachments 2415, 2425, 2435, 2445 in fig. 8], each computer having software capable of sending and receiving network information between said computers via a primary network [e.g., network 101 in fig. 1; network 2101 in fig. 5; network 2401, 2402, 2403 in fig. 8], a method comprising the steps of:

receiving [col. 2, lines 12-24] transmission packets containing said network information into an internal thread [col. 4, lines 12-19; col. 11, lines 6-14] of the primary network and placing the transmission packets into a queue determined by the type of transmission packet;

upon determination that the storage systems are still available ["quickly test mass storage system 122 to determine if it is the cause of the failure of the server 120" in col. 7, lines 65-67; "determine that mass storage system 122 is now connected to computer 111, along with the mass storage system 113" in col. 8, lines 7-14], and the determination [col. 2, lines 25-29] that the transmission packet is a write packet [col. 13, lines 3-8], copying [col. 7, lines 53-56] the transmission packets into a buffer; and the internal thread writes [col. 8, lines 14-20] the contents of the buffer to the storage system and enables transmission [col. 8, lines 14-20; col. 14, lines 22-27] of the stored write packets via said alternate path, said alternate path being implemented as a virtual network interface process [col. 10, lines 22-24] wherein said stored write packets containing said network information are transmitted in a protocol suitable [e.g., col. 6, lines 33-50] for said alternate path enabling continuous availability [col. 1, lines 20-30] of

the network information without use of the primary network [col. 9, lines 62-65] between respective ones of the computers.

Though Ohran et al teach mirroring of the storage systems using an alternative path upon determination of one computer failure [e.g., "detecting a failure of another server's computer 11 and 122" in col. 7, lines 24-26' "detection of the failure of server 121 causes the discontinuation of mirroring" in col. 7, lines 44-46] regardless of availability or unavailability of the primary network, Ohran et al do not expressly disclose mirroring of the storage systems upon determination of the unavailability of the primary network. Yamagami teaches mirroring of the storage systems using an alternative path upon determination of the unavailability of a primary network ["detecting an abnormal condition in the first network and thereupon transferring data using the second network" in col. 3, lines 32-37] in conjunction with a determination that the storage systems [storage systems 100a, 100b in fig. 1] are still available [figs. 4, 6]. At time of the invention, it would have been obvious to one of ordinary skill in the art to include determining the unavailability of the primary network in order to increase reliability by also using the alternative path for mirroring in case that both of the computers of Ohran et al are alive when the primary path is unavailable.

However, the combination of Ohran et al and Yamagami does not expressly disclose upon filling the buffer to a predetermined point waking the internal thread to process the filled buffer. Vinther et al teach a method for providing continuous availability of the network information without use of the network [e.g., ref. No. 19 in fig. 1] comprising the steps of copying transmission packets into a buffer [page 7, lines 5-

14], upon filling the buffer to a predetermined point waking [page 17, lines 28-31] an internal thread to process the filled buffer, and the internal thread writes [page 7, lines 20-23] the contents of the buffer to the storage system. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the combination and Vinther et al because they both teach mirroring network transmission packets received, buffered, and finally stored into a storage system and the Vinther et al's teachings of upon filling the buffer to a predetermined point waking an internal thread to process the filled buffer would increase efficiency in buffering [Vinther et al: page 14, lines 12-18] rather than buffering all data [Ohran et al: col. 7, lines 53-56].

5. As for claim 2, Vinther et al teach prior to the internal thread receiving transmission packets, a client thread submitting the transmission packets into a write buffer [page 7, lines 5-8].

6. As for claim 3, Vinther et al teach calling, by the client thread, a transport data function, wherein the transmission packets are extracted from the buffer [page 7, lines 8-12].

7. As for claim 5, Ohran et al teach configuring the storage system to include a receive volume and a send volume, wherein the contents of the buffer are written to a send volume; copying the contents of the send volume to the receive volume [e.g., col. 3, lines 13-20].

8. As for claim 6, Ohran et al teach the receive volume and the send volume are respectively located on first and second logical volumes of the storage system [e.g., fig. 7].

9. As for claim 8, Ohran et al teach configuring the storage system to include a send volume [e.g., computer system 2110 in fig. 5], configuring a second storage system to include a receive volume [e.g., computer system 2120 in fig. 5], wherein the second storage system is geographically removed from the storage system; writing [col. 8, lines 14-20] the contents of the buffer to the send volume; and copying [col. 8, lines 14-20] the contents of the send volume to the receive volume.

10. As for claim 9, Ohran et al teach returning the internal thread to a sleep state after the contents of the buffer are written to the send volume [col. 4, lines 12-13].

11. As for claim 10, Vinther et al teach copying the contents of the send volume to the receive volume occurs upon a command from one of the plurality of computers [col. 13, lines 3-8].

12. Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohran et al. [US 5,812,748] in view of Yamagami [US 7,096,269 B2].

As for claim 11, Ohran et al teach in a computer system having a plurality of applications [e.g., clients 3700 in fig. 9], in communication with a storage system, each application having a process capable of sending and receiving information [e.g., server requests in col. 2, lines 1-2] regarding said applications over a primary network [e.g., network 101 in fig. 1; network 2101 in fig. 5; network 2401, 2402, 2403 in fig. 8] to and from the plurality of applications, a method comprising the steps of:

determining that the storage systems are still available ["quickly test mass storage system 122 to determine if it is the cause of the failure of the server 120" in col. 7, lines 65-67; "determine that mass storage system 122 is now connected to computer 111, along with the mass storage system 113" in col. 8, lines 7-14]

writing [col. 8, lines 14-20] the application network information from one of the applications to a first volume;

copying [e.g., col. 8, lines 14-20; col. 12, lines 50-54] the application network information written to the first volume to a second volume system;

reading [e.g., col. 4, lines 15-19; col. 12, lines 58-61; col. 14, lines 50-54] the application network information from the second volume; and

enables transmission [col. 14, lines 22-27] of the application network information via an alternate path [e.g., connection between server 111 and storage system 122; communication means 2102 in fig. 6; link between communication means attachments 2415, 2425, 2435, 2445 in fig. 8] between said respective applications, said alternate path being implemented as a virtual network interface process [col. 10, lines 22-24] wherein said stored write packets containing said network information are transmitted in a protocol suitable [e.g., col. 6, lines 33-50] for said alternate path enabling continuous availability [col. 1, lines 20-30] of the network information without use of the primary network [col. 9, lines 62-65] between respective ones of the computers.

Though Ohran et al teach mirroring of the storage systems using an alternative path upon determination of one computer failure [e.g., "detecting a failure of another server's computer 11 and 122" in col. 7, lines 24-26' "detection of the failure of server

121 causes the discontinuation of mirroring" in col. 7, lines 44-46] regardless of availability or unavailability of the primary network, Ohran et al do not expressly disclose mirroring of the storage systems upon determination of the unavailability of the primary network. Yamagami teaches mirroring of the storage systems using an alternative path upon determination of the unavailability of a primary network ["detecting an abnormal condition in the first network and thereupon transferring data using the second network" in col. 3, lines 32-37] in conjunction with a determination that the storage systems [storage systems 100a, 100b in fig. 1] are still available [figs. 4, 6]. At time of the invention, it would have been obvious to one of ordinary skill in the art to include determining the unavailability of the primary network in order to increase reliability by also using the alternative path for mirroring in case that both of the computers of Ohran et al are alive when the primary path is unavailable.

13. As for claim 12, Ohran et al teach reading the network information in less than a predetermined period of time after it is written to the first volume [col. 2, lines 49-60].

14. As for claim 13, Ohran et al teach the plurality of applications performs clustering functions [col. 16, lines 15-17].

15. As for claim 14, Yamagami teaches the plurality of application performs internet browsing functions [col. 1, lines 30-42].

16. As for claim 15, Yamagami teaches the network is the internet [col. 1, lines 30-42].

17. As for claim 16, Ohran et al teach a second storage system geographically remote from the storage system, wherein the first volume is on the storage system and the second volume is on second storage system [figs. 7-9].

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ilwoo Park whose telephone number is (571) 272-4155. The examiner can normally be reached on Monday through Friday from 9:00 AM to 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Ilwoo Park/
Primary Examiner, Art Unit 2182
2/24/2009